

Application No.: 10/520,816

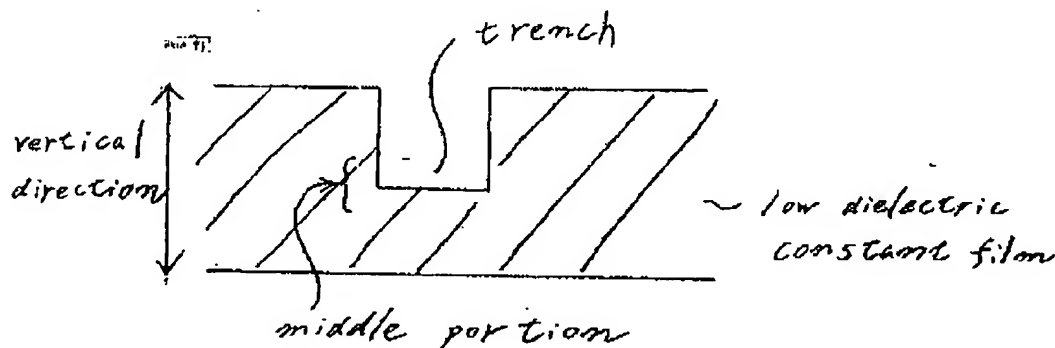
REMARKS

Claims 1, 6, 11 and 16 are independent.

Claims 1, 6 and 11 stand rejected under 35 U.S.C. § 102 as being anticipated by Steiner '273 ("Steiner"). This rejection is respectfully traversed for the following reasons.

In the outstanding Office Action, the Examiner alleges that "the low dielectric film, 42, [of Steiner] has two parts and the two parts are separated in the middle portion by the trench/bottom of the trench (82)" (page 7, lines 19-20 of outstanding Office Action). However, contrary to the Examiner's assertion, the film 42 is NOT separated by the *bottom* of the trench 82. As clearly shown in Figure 6 of Steiner, the trench 82 passes completely through the film 42 (as well as film 36) so that the bottom of the trench is located entirely below the film 42.

Nonetheless, to further clarify the distinction between the present invention and Steiner, each of claims 1, 6 and 11 now recites in pertinent part, "a bottom of the trench is located in the middle portion of *the vertical direction* of the low dielectric constant film" (emphasis added). The below drawing illustrates one exemplary embodiment according to the present invention.



In direct contrast, the Examiner alleges that the bottom of the alleged trench 82 is located in the "middle portion" of *the horizontal direction* of the film 42.

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Indeed, according to one aspect of the present invention, having a bottom of the trench located in the middle portion of the vertical direction of the low dielectric constant film in combination with the other features recited in the pending claims, can make it possible to, for example, bury an interconnect in the low dielectric constant film, thereby providing the capability to reduce capacitance between the interconnects. In addition, the claimed combination can also make it possible to suppress nitrogen from entering the low dielectric constant film and suppress diffusion of an amine or the like from the low dielectric constant film through the hole into the resist that is used to form the trench, thereby providing the capability to prevent the occurrence of resist poisoning (*see, e.g.*, page 6, lines 6-12; page 7, line 19 - page 8, line 5; and page 9, lines 6-13 of Applicants' specification).

However, according to Steiner, the trench 82 reaches the alleged nitrogen-containing insulating film 30 whereby resist poisoning occurs owing to the nitrogen from the nitrogen-containing insulating film 30. Only Applicants have recognized and considered the aforementioned issues related to resist poisoning, etc., and conceived of the novel combination of features which can enable obviating said issues. The cited prior art is silent as to resist poisoning, etc., in the particular device, much less suggest or provide motivation to reach the claimed combination of features.

Claim 16 stands rejected under 35 U.S.C. § 102 as being anticipated by Huang et al. '896 ("Huang"). This rejection is respectfully traversed for at least reasons similar to those discussed above regarding claims 1, 6 and 11 (*see, e.g.*, page 10, lines 2-12 of Applicants' specification). In this regard, Huang is silent as to "a bottom of the trench is located in the middle portion of the vertical direction of the low dielectric constant film" recited in claim 16.

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In contrast, the alleged trench 348a is formed only in the low density insulating films 308a and 312a above the alleged low dielectric constant film 306a.

As anticipation under 35 U.S.C. § 102 requires that each and every element of the claim be disclosed, either expressly or inherently (noting that "inherency may not be established by probabilities or possibilities", *Scaltech Inc. v. Retec/Tetra*, 178 F.3d 1378 (Fed. Cir. 1999)), in a single prior art reference, *Akzo N.V. v. U.S. Int'l Trade Commission*, 808 F.2d 1471 (Fed. Cir. 1986), based on the forgoing, it is submitted that Steiner and Huang do not anticipate the independent claims, nor any claim dependent thereon. The Examiner is directed to MPEP § 2143.03 under the section entitled "All Claim Limitations Must Be Taught or Suggested", which sets forth the applicable standard for establishing obviousness under § 103:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (citing *In re Royka*, 180 USPQ 580 (CCPA 1974)).

In the instant case, the pending rejections do not "establish *prima facie* obviousness of [the] claimed invention" as recited in the pending claims because the proposed combinations fail the "all the claim limitations" standard required under § 103.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as the independent claims are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

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Based on the foregoing, it is respectfully submitted that all pending claims are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejections under 35 U.S.C. § 102/103 be withdrawn.

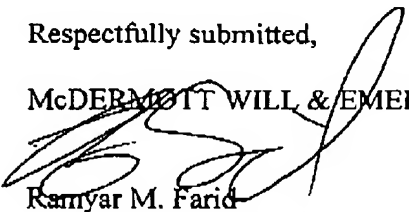
CONCLUSIONS

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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